

REMARKS

After the foregoing amendment, claims 1-2, 4-5, 8-13 and 15-18 are active in the present application. Claims 3, 6-7 and 14 have been cancelled and claims 1, 8-9, 11 and 12 have been amended. No new matter has been added by the amendment and the amendment is believed to place the application in condition for allowance. Accordingly, reconsideration and allowance of the application, as amended, are respectfully requested.

Claim 12 was objected to for reciting "first and second dice." As suggested by the Examiner, claim 12 has been amended to recite "first and second dies." Claim 11 was amended to correct the same informality. In view of the amendment to claim 12, Applicants respectfully request that the objection to claim 12 be withdrawn.

Claims 1-2 and 5 were rejected under 35 U.S.C. §102(e) as anticipated by Glenn et al (U.S. 6,530,515). Applicants respectfully traverse the rejection.

Claim 1 has been amended to include the subject matter of claim 3 and thus now recites that the top and bottom die are of similar size and shape. The Glenn et al. patent shows a top die that is smaller than the bottom die. Thus, the Glenn et al. patent no longer anticipates claim 1 and dependent claims 2 and 5. In view of the amendment to claim 1, Applicants respectfully request that the rejection of claims 1-2 and 5 as anticipated by the Glenn et al. patent be withdrawn.

Claims 1-4, 6, 9-15 and 18 were rejected under 35 U.S.C. §102(e) as anticipated by Glenn et al (U.S. 2002/0195624). The Office Action refers to FIGS. 7-8 as disclosing a stacked multichip package having all of the claimed features of the present invention. Applicants respectfully traverse the rejection.

The present invention is directed to a stacked die device in which a top die is spaced from a bottom die by a bead 124 of adhesive material such as an epoxy with a first viscosity. The bead is formed on a top surface of the bottom die between a peripheral area and a central area. The bead is sized to space the top die from the bottom die such that wire bonds from the bottom die bond pads to the substrate are not damaged by attachment of the top die on the bottom die (Specification [0035]). Note that the die bonding pads are located in the peripheral area (FIG. 4). The bead forms a dam into which an adhesive material 126 is dispensed (Specification [0036] and [0043]). Further, the bead prevents the adhesive material 126 from flowing onto the wirebonds (Specification [0042]).

The Glenn et al. application discloses a stacked die device similar in intent to the present invention but which differs in some significant aspects. Referring to FIG. 7 of the Glenn et al. application, a top die 16 is attached to a bottom die 14 with an adhesive material disposed between a bead 40 of adhesive material that is applied over the wirebonds (and die bond pads) that connect the bottom die to the substrate. The specification states that the adhesive bead 40 encapsulates the wire bonding pads 34 on the top surface of the first die 14, as well as the inner ends of the conductive wires 38 that are bonded thereto. See Glenn et al. at para. [0040]. The adhesive material located within the bead comprises a spacer 50 having bottom and top adhesive layers 52, 54 that secure the spacer 50 to the bottom and top die, respectively.

In contrast, the bead 124 of the present invention does not cover the bond wires or bottom die bond pads, as shown in FIG. 4. Second, the present invention does not separate the top and bottom dies with a spacer. Rather, the top and bottom dies are separated by the bead 124 and the bead is sized to space the top and bottom dies from each other. Thus, Glenn et al. actually is more like the prior art shown in FIG. 2 and discussed in the Background of the Invention at paras. [0004] to [0006], except that Glenn et al. include a bead over the wire bonds to protect against wire sweep. Thus, the bead 40 is located in a different place and performs a different function than the bead 124 of the present invention, and the adhesive material (spacer 50 with adhesive layers 52, 54) is very different from the adhesive material of the present invention.

Both independent claims 1 and 12 recite that the bead is located between the peripheral area of the bottom die where the bond pads are located and the central area, and that the bead maintains a predetermined spacing between the bottom die and the top die. Since the Glenn et al. application does not teach, suggest or disclose either of these features, the present invention is not anticipated by Glenn et al. In view of the foregoing, Applicants respectfully request that the rejection under §102(e) of claims 1-4, 6, 9-15 and 18 be withdrawn.

Claims 5, 7-8 and 16-17 were rejected under 35 U.S.C. §103 as being unpatentable over the Glenn et al. application in view of the Glenn et al. patent, and claims 3-4 and 14-15 were rejected under §103 as being unpatentable over the Glenn et al. patent in view of the Glenn et al. application. Applicants respectfully traverse these two rejections.

As noted above, the Glenn application teaches forming beads 40 over the bonds and bond pads of the bottom die and spacing the top and bottom die with a spacer 50. The Glenn patent is directed to top and bottom chips 452 and 412 (of different sizes) wherein the top chip 452 is attached to the bottom chip 412 with a bead 450 of epoxy. The bead 450 functions only as a

means of attaching the top and bottom chips 452 and 412. It is not used to space the chips from each other to protect the wirebonds, as the wirebonds are not in danger of being compromised by the top chip because the top chip is smaller than the bottom chip. In contrast, the present invention uses the bead as a dam to contain the adhesive material 126 that is used to attach the top and bottom dies 106 and 104. Applicants submit that the teachings of the two Glenn et al. references cannot really be combined properly to come up with the present invention. This is because the Glenn patent teaches using a bead only to attach the dies, leaving the area within the bead empty because the surface of the bottom die (circuit) must remain free of material. Accordingly, reconsideration and withdrawal of the rejections under §103 are requested.

Claims 6-13 and 16-18 were rejected under 35 U.S.C. §103 as unpatentable over the Glenn et al. patent in view of U.S. patent application US 2003/0057538 (Watson). The Office Action states that Watson teaches forming the bead on the top surface of the bottom die between the peripheral area and the central area to control height, citing FIG. 10 and para. [0037]. Applicants respectfully traverse the rejection.

As discussed above, the Glenn et al. patent teaches different size top and bottom chips and attaching the top and bottom chips with an adhesive bead that is located between a peripheral area of the bottom die and a central area of the bottom die.

Watson discloses in FIG. 10 a stacked die package 11 in which a top die 12 is attached to a bottom die 2 with a die attach adhesive 13. The die attach adhesive 13 comprises a combination of a curable polymeric base material and inorganic insulating particles or spacer beads 14. Watson stacks different size circuits and does not form a dam or bead that surrounds the bottom die central area into which another adhesive material for attaching the top die to the bottom die. may be dispensed. Rather, Watson uses the die attach material over the whole central top surface of the bottom die. Thus, combining Watson with Glenn et al. would not provide a stacked device in which the top die is attached to the bottom die with an adhesive material located within a surrounding bead of another adhesive material.

Since the cited references do not teach, suggest or disclose attaching a top die to a bottom die in the manner claimed by the present invention, the claims, as amended, are not obvious. Accordingly, Applicants submit that claims 8-13 and 16-18 are patentable over the cited references and respectfully request that the rejection under §103 be withdrawn.

In view of the foregoing amendment and remarks, it is respectfully submitted that the present application, including claims 1-2, 4-5, 8-13 and 15-18, is in condition for allowance and such action is respectfully solicited.

Please charge any fees associated herewith, including extension of time fees, to 502117.

Respectfully submitted,

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